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Docket No.: 220983US0PCT

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ATTORNEYS AT LAW

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

RE: Application Serial No.: 10/089,109
Applicants: Manabu SUHARA, et al.
Filing Date: March 26, 2002
For: LITHIUM-COBALT COMPOSITE OXIDE, METHOD FOR PREPARING THE SAME, POSITIVE ELECTRODE FOR LITHIUM SECONDARY CELL AND LITHIUM SECONDARY CELL USING THE SAME
Group Art Unit: 1745
Examiner: CANTELMO, G.

SIR:

Attached hereto for filing are the following papers:

Request for Rehearing

Our check in the amount of **-0-** is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R 1.136 for any necessary Extension of Time to make the filing of the attached documents timely, please charge or credit the difference to our Deposit Account No. 15-0030. Further, if these papers are not considered timely filed, then a petition is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF	:
MANABU SUHARA, ET AL.	: EXAMINER: CANTELMO, G.
SERIAL NO: 10/089,109	:
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REQUEST FOR REHEARING

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

Applicants respectfully request rehearing pursuant to 37 C.F.R. § 41.52 of the affirmance of the Examiner's rejection of Claim 4 in Rejections (3) and (6), as stated at page 4 of the Decision of the Board entered November 16, 2006 (Decision).

Claim 4 recites:

> The hexagonal lithium-cobalt composite oxide for a lithium secondary cell according to Claim 1, wherein the packing press density of the hexagonal lithium-cobalt composite oxide is from 2.90 to 3.35 g/cm^3.

The Board holds:

> The dispositive question is, therefore, whether it would have been obvious to optimize the packing density of the lithium compound (lithium cobalt composite oxide) taught by Masashi or Toyoguchi. On this record, we answer this question in the affirmative.

(Decision at 10).

As support for its holding, the Board finds:

> As indicated at column 2, line 34 to column 3, line 6 of Yamahira, optimizing the packing density of a sintered (fired) lithium compound for lithium secondary cells (inclusive of the lithium cobalt composite oxides of Masashi and Toyoguchi) improves the performance of the electrodes formed therefrom. This packing density, which is defined in terms of a volumetric density, includes the density recited in claim 4. See column 3, line 56 to column 4, line 2. The density recited in claim 4 is said to be an optimum density for lithium secondary cells. *Id.*
>
> Thus, notwithstanding the Appellants' arguments to the contrary, we concur with the Examiner that providing an optimum packing density, such as that claimed, for the lithium compound taught by Masashi or Toyoguchi for purposes of optimizing lithium secondary cells would have been well within the ambit of one of ordinary skill in the art. *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980)("[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art."). This is especially true in this situation since one of ordinary skill in the art would have been led to employ the claimed packing density, motivated by a reasonable expectation of successfully obtaining the advantageous properties taught by Yamahira.

(Decision at 11).

For reasons now discussed, it is respectfully submitted that the Board's findings on Claim 4 are clearly erroneous and its holding thereon is incorrect as a matter of law.

The packing press density is defined in the specification herein at page 12, lines 4-7 as "an apparent density of a press-molded product when the lithium-cobalt composite oxide powder is pressed under a load of 0.3 t/cm^2".

In contrast, the volumetric density in Yamahira is defined as the density obtained of a mixture including lithium raw material and cobalt raw material that is compression-molded under a specific pressure (1 ton to 10 tons) to a pellet 16.0 mm in diameter, and the pellet is

then baked under a specific condition to a form a $LiCoO_2$ sintered product 15.5 mm in diameter (column 5, line 66 to column 8, line 60).

When the respective measuring methods of packing press density herein and volumetric density of Yamahira are compared, the differences are manifest. Herein, a mixture including lithium raw material and cobalt raw material is fixed to a lithium-cobalt composite oxide. The lithium-cobalt composite oxide is pressed and then measured simply. In Yamahira, the mixture of raw materials is compression-molded to a pellet; after this pellet is fired to a form $LiCoO_2$ sintered product, the volumetric density of the $LiCoO_2$ sintered product is measured.

Moreover, the applied pressures of the present invention and of Yamahira differ considerably. In the present invention, the applied pressure is $0.3t/cm^2$. In Yamahira, the mixture of raw materials is pressed under a specific pressure (1 ton to 10 tons) to a pellet 16.0 mm in diameter. Using these figures from Yamahira, the applied pressure per unit area is calculated as follows:

The area of a pellet having a diameter of 16mm is πr^2, or $(3.14) \times (16 \div 2)^2 = 200.96mm^2$, or approximately $2.0cm^2$. When the pressure is 1 ton, the applied pressure is $1 \div 2.0$, or $0.5t/cm^2$; when the pressure is 3 tons, the applied pressure is $1.5t/cm^2$; etc Thus, the volumetric density is measured under an applied pressure that is at least 1.67 times $(0.5 \div 0.3)$ that of the present invention. It necessarily follows that increasing the applied pressure results in increase of packing press density..

It is thus a clearly invalid comparison to compare the packing press density of the present invention with the volumetric density of Yamahira as a pressed object, since the respective measuring processes and applied pressures are so different from each other.

As an example, the packing press density of Example 9 herein is $3.18g/cm^3$, as described in the specification at page 27, line 7. In Yamahira, on the other hand, the

volumetric density is 2.0g/ml when the applied pressure is 1 ton, i.e., 0.5t/cm^2, in Table 2 thereof; the applied pressure (0.5t/cm^2) is 1.67 times greater than the applied pressure of the present invention (0.3t/cm^2), yet the volumetric density (2.0g/ml) of lithium-cobalt composite oxide described in Yamahira is lower than the 3.18g/cm^3 of Example 9 herein. In other words, the greater applied pressure in Yamahira results in a volumetric density having a numerically lower value than the present packing press density. It is thus understood that it is unreasonable to compare the packing press density of the present invention with the volumetric density of Yamahira.

In sum, though the numerical values for volumetric density in Yamahira may overlap with the numerical values for packing press density in Claim 4 herein, the overlap is essentially meaningless.

Nor is there any evidence in the record that packing press density is a result-effective variable. Thus, Claim 4 is patentable under the rationale of *In re Antonie*, 559 F.2d 618, 195 USPQ 6, 8-9 (CCPA 1977) (exceptions to rule that optimization of a result-effective variable is obvious, such as where the results of optimizing the variable are unexpectedly good or where the variable was not recognized to be result effective). Applicants are entitled to prevail under at least the latter of the above exceptions.

Nor would one of ordinary skill in the art have derived a disclosure of volumetric density from Yamahira, which is drawn to a coin-shaped cell, as relevant to Masashi or Toyoguchi, neither of which disclose or suggest a coin-shaped cell.

The above arguments also apply to rejection (6), which arguments are herein incorporated by reference, except that the claims of the copending application take the place of Masashi and Toyoguchi.

For all the above reasons, Applicants respectfully request that the Board vacate its affirmance of the rejections of Claim 4, and REVERSE these rejections.

Respectfully submitted,

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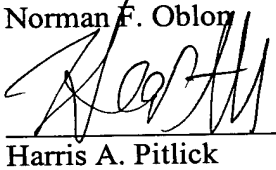

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